

AMENDMENTS TO THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double-bracketed text indicating deletions.

Listing of the Claims:

1. (Previously Presented) A pump for conveying a pumped fluid using an actuating fluid, the pump comprising:

a rigid outer casing defining an interior space; and

a tube structure accommodated in the interior space, the tube structure being flexible and substantially inelastic, an interior of the tube structure defining a pumping chamber for receiving pumped fluid, the tube structure being movable between laterally expanded and collapsed conditions for varying the volume of the pumping chamber thereby to provide discharge and intake strokes, the tube structure being maintained in a taut condition between the ends thereof, a region of the interior space surrounding the tube structure defining an actuating region for receiving and accommodating actuating fluid, the pumping chamber being configured to receive pumped fluid to cause the tube structure to move towards the expanded condition and the pumping chamber thereby undergoing an intake stroke, the pumping chamber undergoing a discharge stroke upon collapsing of the tube structure in response to an action of actuating fluid in the actuating region,

wherein one end of the tube structure is closed and the other end is connected to a port through which pumped fluid enters into and discharges from the pumping chamber as the pumping chamber performs intake and discharge strokes and the tube structure is movably supported to accommodate longitudinal extension and contraction of the tube structure.

2. (Canceled)

3. (Previously Presented) A pump according to claim 1, wherein the tube structure is supported at the closed end thereof.

4. (Canceled)

5. (Previously Presented) A pump according to claim 1, wherein the closed end of the tube structure is movably supported.

6. (Previously Presented) A pump according to claim 1, wherein the actuating region includes an actuating annulus substantially surrounding the tube structure and an actuating chamber located at the closed end of the pump.

7. (Previously Presented) A pump according to claim 6 wherein,
the actuating annulus is in fluid communication with the actuating chamber.

8. (Previously Presented) A pump according to claim 1, further comprising:
a device to bleed fluid from the pump.

9. (Previously Presented) A pump according to claim 8, further comprising:
a separate device to bleed air from the pumping chamber and the actuating region, wherein the air is bled from the pumping chamber during the intake stroke and air is bled from the actuating region during the discharge stroke.

10. (Previously Presented) A pump according to claim 1, further comprising:
a monitoring device to monitor the pump during the intake and discharge stroke.

11. (Previously Presented) A pump according to claim 10, wherein the monitoring device monitors the condition of the tube structure.

12. (Previously Presented) A pump according to claim 10, wherein the monitoring device monitors, directly or indirectly, the position of the closed end of the tube structure.

13. (Previously Presented) A pump according to claim 10, wherein the monitoring device monitors the pressure differential between components of the pump.

14. (Previously Presented) A pump according to claim 10, wherein the monitoring device at least indicates when the discharge and intake strokes have been completed.

15. (Previously Presented) A pumping system comprising:
a pump in accordance with claim 1;
a delivery device for delivering pumped fluid to the pumping chamber in timed sequence for causing the pumping chamber to undergo an intake stroke; and
a device for supplying actuating fluid to the actuating region in timed

sequence to cause the tube structure to laterally collapse whereby the pumping chamber undergoes a discharge stroke.

16. (Previously Presented) A pumping system according to claim 15, wherein the delivery device comprises a delivery pump.

17. (Previously Presented) A pumping system according to claim 15, wherein the actuating fluid is one of hydraulic oil and water.

18. (Previously Presented) A pumping system according to claim 17, wherein the actuating fluid is hydraulic oil.

19. (Previously Presented) A pumping system according to claim 18, wherein the supply device includes a hydraulic circuit incorporating a reservoir for hydraulic oil and a hydraulic pump.

20. (Previously Presented) A pumping system according to claim 19, wherein the hydraulic circuit also includes an intake and exit valve system for regulating the delivery of hydraulic oil into, and the discharge of hydraulic oil from, the actuating region in timed sequence.

21. (Previously Presented) A pumping system according to claim 17, wherein the actuating fluid is water.

22. (Previously Presented) A pumping system according to claim 21, wherein

the supply device includes a water reservoir at an elevated location in order to supply the water at the appropriate pressure head.

23. (Previously Presented) A pumping system according to claim 15, wherein the delivery of the actuating fluid to the actuating region is at an opposed end to the port through which pumped fluid enters into and discharges from the pumping chamber.

24. (Previously Presented) A pumping system according to claim 15, wherein the outlet of the actuating fluid from the actuating region is also at an opposed end to the port through which pumped fluid enters into and discharges from the pumping chamber.

25. (Previously Presented) A pumping system comprising:
two pumps, each pump being in accordance with claim 1;
a delivery apparatus for delivering pumped fluid to the pumping chambers in timed sequence for causing the pumping chambers to undergo an intake stroke;
and

an apparatus for supplying actuating fluid to the actuating regions in timed sequence to cause the tube structures to laterally collapse whereby the pumping chambers undergo a discharge stroke,

wherein the two pumps are operated sequentially such that the pumping chamber of one pump performs an intake stroke while the pumping chamber of the other pump performs a discharge stroke, and vice versa.

26. (Previously Presented) A pumping system according to claim 25, wherein the sequential operation of the two pumps is such that a generally uninterrupted supply of pumped fluid is expelled from the pumping system.

27. (Previously Presented) A pumping system according to claim 25, wherein the duration of the discharge stroke is longer than the duration of the intake stroke.

28. (Previously Presented) A pumping system according to claim 25, wherein one pump completes its intake stroke and commences its discharge stroke while the other pump is completing its discharge stroke.

29. (Previously Presented) A pumping system according to claim 25, wherein the intake stroke of one pump is completed by the time the discharge stroke from the other pump is completed and a flow from the discharge stroke is equal in flow to the desired flow of pump fluid from the pumping system.

30. (Previously Presented) A pumping system according to claim 25, wherein the two pumps have a common delivery device and a common supply device, with appropriate valve systems controlling the sequence of operation.

31. (Previously Presented) A pumping system according to claim 25, wherein each pump is oriented so that the closed end of the tube structure is elevated in relation to the other end thereof.

32. (Previously Presented) A pumping system according to claim 25, wherein

the delivery and exit of the actuating fluid to the actuating region is adjacent the closed end.

33. (Previously Presented) A pump for conveying a pumped fluid using an actuating fluid, the pump comprising:

a rigid outer casing defining an interior space; and

a flexible tube structure accommodated in the interior space, an interior of the tube structure defining a pumping chamber for receiving pumped fluid, the tube structure being movable between laterally expanded and collapsed conditions for varying the volume of the pumping chamber thereby to provide discharge and intake strokes, one end of the tube structure being closed and the other end communicating with a port through which pumped fluid enters into and discharges from the pumping chamber as the pumping chamber performs the intake and discharge strokes, a region of the interior space surrounding the tube structure defining an actuating region for receiving actuating fluid, the tube structure being moveably supported and maintained in a taut condition, the pumping chamber being configured to receive pumped fluid to cause the tube structure to move towards the expanded condition and the pumping chamber thereby undergoing an intake stroke, the pumping chamber undergoing a discharge stroke upon collapsing of the tube structure in response to an action of actuating fluid in the actuating region.

34. (Previously Presented) A pump according to claim 33, wherein the tube structure is substantially inelastic.

35. (Previously Presented) A pump according to claim 33, wherein the port through which fluid enters the pumping chamber is at an opposed end to where the actuating fluid enters the pump.

36. (Previously Presented) A pumping system comprising:

at least two pumps, each pump being in accordance with claim 1;

a delivery device for delivering pumped fluid to each pumping chamber in timed sequence, causing each pumping chamber to undergo an intake stroke; and

a device for supplying actuating fluid to each actuating region in timed sequence to cause a respective tube structure of the pumping chamber to laterally collapse and the pumping chamber undergoing a discharge stroke, whereby the sequential operation of the at least two pumps expels a generally uninterrupted supply of pump fluid from the pumping system.

37. (Canceled)

38. (Canceled)

39. (Previously Presented) A pumping system according to claim 36, wherein the closed end of the pumping chamber is elevated in relation to the other end thereof.

40. (Previously Presented) A method of operating a pumping system in accordance with claim 36, wherein a duration of the discharge stroke of one pump is longer than a duration of the intake stroke of the other pump, and vice versa,

whereby, when operated sequentially, the pumping system delivers a generally uninterrupted supply of fluid.

41. (Previously Presented) A pump for conveying a pumped fluid using an actuating fluid, the pump comprising:

a rigid outer casing defining an interior space; and

a tube structure accommodated in the interior space, the tube structure having one end closed and in an elevated position in relation to the other end, which communicates with a port through which pumped fluid enters into and discharges from the pumping chamber, the tube structure being moveably supported and maintained in a taut condition, the interior of the tube structure defining a pumping chamber for receiving pumped fluid, the tube structure being movable between laterally expanded and collapsed conditions for varying the volume of the pumping chamber thereby to provide discharge and intake strokes, a region of the interior space surrounding the tube structure defining an actuating region for receiving actuating fluid, the pumping chamber being configured to receive pumped fluid to cause the tube structure to move towards the expanded condition and the pumping chamber thereby undergoes an intake stroke, the pumping chamber undergoing a discharge stroke upon collapsing of the tube structure in response to the action of actuating fluid in the actuating region.

42. (Previously Presented) A pump according to claim 41, wherein the actuating fluid enters the actuating region adjacent the closed end of the pumping chamber.

43. (Previously Presented) A pump according to claim 41, wherein the tube structure is flexible and substantially inelastic.

44. (Cancelled).

45. (Cancelled).

46. (Cancelled).